



# ENGG8401

## Safety and Risk Engineering

Session 1, In person-scheduled-weekday, North Ryde 2025

*School of Engineering*

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#### **Disclaimer**

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

Unit convenor and teaching staff

Lecturer

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Tutor

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Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

The objective of this unit is to provide an understanding of principles and methods of safety and risk engineering applicable to industrial operation. Specific topics include analysis of past accidents; risk assessment methods, risk analysis tools, risk-based decision making, process safety, engineering safety, occupational safety, safety assessment studies, and regulatory perspective of safety.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure; Sustainable Cities and Communities

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

**ULO1:** Demonstrate advanced knowledge of risk and safety engineering.

**ULO2:** Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.

**ULO3:** Critically review safety performance in a range of engineering operations.

**ULO4:** Apply risk-based design decision methods to industrial operations.

**ULO5:** Design risk-based safety measures for complex engineering operations.

## **General Assessment Information**

### **Student Responsibilities**

Be familiar with University policy and College procedures and act in accordance with those policy and procedures.

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

### **Notifications**

Formal notification of assessment tasks, grading rubrics and due dates will be posted on iLearn. Although all reasonable measures to ensure the information is accurate, The University reserves the right to make changes without notice. Each student is responsible for checking iLearn for changes and updates.

### **Assignment submissions and plagiarism policies**

All assignments and reports must be submitted electronically through iLearn (in pdf format) unless otherwise explicitly stated. Submissions will undergo plagiarism checkers using the Turnitin software and any work deemed to have 15% or higher similarity score may incur academic penalty. For more details on the policies of academic penalties relating to academic honesty, please refer to the policies and procedures section below.

Submissions are expected to be typed set in a logical layout and sequence and graphs are expected to be drawn using suitable software. Markers WILL NOT grade poorly organized or illegible scans or drafts. The expected workload includes preparation of final copies and clear diagrams.

### **Late submissions**

Late submissions will not be accepted. In the event that a report is submitted late, between 0 and 24 hours a deduction of 25% will be made, between 24 and 48 hours a deduction of 50% will be made, more than 48 hours will result in no marks being awarded. Extenuating circumstances will be considered upon lodgement of a formal notice of disruption of studies.

### **Grading and passing requirements for unit**

For further details about grading, please refer below in the policies and procedures section. In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Mid-term</u>	20%	No	Week 7
<u>Term Project</u>	50%	No	Week 13
<u>Final Exam</u>	30%	No	Examination Period

### Mid-term

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 2 hours

Due: **Week 7**

Weighting: **20%**

Students will be assessed at the mid of the semester. This will be an open book exam for 2 hours.

On successful completion you will be able to:

- Demonstrate advanced knowledge of risk and safety engineering.
- Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.
- Critically review safety performance in a range of engineering operations.
- Apply risk-based design decision methods to industrial operations.
- Design risk-based safety measures for complex engineering operations.

### Term Project

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 81 hours

Due: **Week 13**

Weighting: **50%**

This is a group term project. Students are going to work on the project from the beginning of the semester. Each group will work on safety and risk engineering applications with a focus on a particular industry (e.g. oil and gas, mining, cement, etc.). Students will receive feedback on their progress to achieve each individual learning outcome during the semester. This will happen by breaking the project to different tasks by the lecturer (considering each individual learning

outcome), and assess the project based on achieving the learning outcomes individually.

On successful completion you will be able to:

- Demonstrate advanced knowledge of risk and safety engineering.
- Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.
- Critically review safety performance in a range of engineering operations.
- Apply risk-based design decision methods to industrial operations.
- Design risk-based safety measures for complex engineering operations.

## Final Exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 2 hours

Due: **Examination Period**

Weighting: **30%**

This will be a 2 hrs open book exam.

On successful completion you will be able to:

- Demonstrate advanced knowledge of risk and safety engineering.
- Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.
- Critically review safety performance in a range of engineering operations.
- Apply risk-based design decision methods to industrial operations.
- Design risk-based safety measures for complex engineering operations.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

The lecture slides, notes, and journal papers sharing with the students.

## Unit Schedule

Refer to the ILearn for the unit schedule.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [connect.mq.edu.au](https://connect.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a

range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

### Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#).

The policy applies to all who connect to the MQ network including students.

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Unit information based on version 2025.03 of the [Handbook](#)